

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 049PCT 1554	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/012297	International filing date (<i>day/month/year</i>) 29.10.2004	Priority date (<i>day/month/year</i>) 31.10.2003	
International Patent Classification (IPC) or national classification and IPC C08G63/78, B01J19/24, B01J19/18			
Applicant UHDE INVENTA-FISCHER GMBH & CO. KG			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>7</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
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<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/012297

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

 - international search (Rule 12.3 and 23.1(b))
 - publication of the international application (Rule 12.4)
 - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished
 the description:
 pages 1-27 _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____
 the claims:
 nos. _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* 1-31 received by this Authority on 22.08.2005 with telefax
 nos.* _____ received by this Authority on _____
 the drawings:
 sheets 1/7-7/7 _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____
 a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/012297

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1–31	YES
	Claims	_____	NO
Inventive step (IS)	Claims	1–31	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	1–31	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

This report makes reference to the following documents:

D1: DE 101 55 419

D2: US 4 289 895

1. Document D1 is regarded as the closest prior art and discloses (the references in parentheses are to that document):

a tower reactor comprising reaction zones for simultaneous esterification and/or transesterification, as well as pre-condensation, the individual reaction zones being interconnected and united in the tower reactor.

The subject matter of independent claim 1 differs from the above in that:

- the tower reactor is designed in its top third as a hydrocyclone (2) with an attached heat exchanger (5), and comprises a feed pipe (3) for the paste, slurry and/or liquid raw material mixture,
- the zone of the tower reactor below the

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITYInternational application No.
PCT/EP2004/012297**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

hydrocyclone (2) is designed in the form of a downdraft cascade (7);

- the cascade (7) communicates via a pipe with the lower part of the tower reactor, which is designed in the form of a single-stage or multiple-stage falling-film zone (9) with pre-expansion (8).

2. The subject matter of claim 1 is thus novel (PCT Article 33(2)).

The present invention can therefore be considered to address the problem of simplifying a tower reactor.

3. The solution to this problem, as proposed in claim 1 of the present application, involves an inventive step (PCT Article 33(3)) for the following reasons. Document D1 does not describe the solution according to the application.

Document D2 describes a device with three zones (40, 60a, 60b). Zone (40) is not integrated in the tower reactor. For this reason, pipes are required in the device to convey liquid from zone (40) to zone (60a). Document D2 thus neither describes nor suggests the solution according to the application.

4. Claims 2–30 are dependent on claim 1 and thus likewise meet the PCT novelty and inventive step requirements.

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5. Claim 31 is novel and inventive because the tower reactor to which it relates is novel and inventive.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITYInternational application No.
PCT/EP2004/012297**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

6. As explained below, some of the features in the device claims 14, 18 and 21 relate to a process for using the device and not to the definition of the device in terms of its technical features. The intended restrictions are therefore unclear from the claim, which thus does not comply with PCT Article 6.
7. In claim 14, the features, "owing to the pressure loss in the slot, a constant filling level is generated above the pipes", "the slots are designed in such a way that viscosity variations do not cause any changes in filling level, but rather a change in filling level in relation to liquid throughput", are process features. They do not describe the device *per se*, but rather what happens when the device is used.
8. In claim 18, the feature, "a total wetting depending on product viscosity", is a process feature. It does not describe the device *per se*, but rather what happens when the device is used.
9. In claim 21, the feature, "with organic heating medium in vapour form", is a process feature. The feature, "with organic heating medium in vapour form", does not describe the device *per se*. It describes the device when the heating medium is conveyed through the pipe and heated until it is in vapour form.